

PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE
THE BOARD OF APPEALS**

EX PARTE MOSTAFAZADEH et. al.

Application for Patent

Filed December 10, 2001

Application No. 10/016,750

Examiner Jarrett J. Stark, Art Unit 2823

FOR:

LEAD FRAME DESIGN FOR INCREASED CHIP PINOUT

REPLY BRIEF

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I. THE OUTSTANDING REJECTION

The Examiner's Answer reiterates the final rejection of claims 11-22 as being an improper recapture of broadened claimed subject matter surrendered in the original application. It is respectfully submitted that the outstanding rejection applies the wrong standard for the recapture inquiry and that when the proper standard is applied, it is clear that claims 11-22 should not be barred under 35 USC §251.

II. THE STEPS IN A PROPER RECAPTURE ANALYSIS

The Court of Appeals for the Federal Circuit has articulated a three-step process for applying the recapture rule. See, e.g., In re Clement, 45 USPQ2d 1161, 1165-65 (Fed. Cir. 1997); Pannu v. Storz Instruments Inc., 59 USPQ2d 1597 (Fed. Cir. 2001); Kim v. Conagra Foods, 80 USPQ2d 1495, 1501 (Fed. Cir. 2006). See also, MPEP §1412.02. More specifically,

The first step is to determine whether and in what aspect the reissue claims are broader than the patent claims. The second step is to determine whether the broader aspects of the reissued claim related to surrendered subject matter. Finally, the court must determine whether the reissued claims were materially narrowed in other respects to avoid the recapture rule. (Kim, 80 USPQ2d @ 1501).

A) Step 1 – In What Aspect are the Reissue Claims Broader than the Patent Claims?

The Final Rejection and the Examiner's Answer take the position that all of claims 11-22 are broader than the original claims because they do not contain the requirement that the leads/contacts each include "a circular portion formed as an attachment pad." Each of the claims on appeal (see, e.g., independent claims 11, 19 and 23) require the presence of "attachment pads." However, none of the claims on appeal retain the requirement that the attachment pads have "circular portions." The Applicant readily acknowledges that all of the claims on Appeal are broader than the original patent claims in some aspects in that they have eliminated the requirement that the attachment pads have "circular portions."

B) Step 2 – Does the Broader Aspect of the Reissue Claims Relate to Surrendered Subject Matter?

During prosecution of the original patent application, original independent claims 1 and 9 (issued claims 1 and 10) were amended to include the requirement that each of the leads include "a circular portion formed as an attachment pad." See Amendment filed July 8, 1999. Prior to that

amendment, the claim did not require the attachment pads. Therefore, it is acknowledged that the broader aspect of the claims referred to by the Examiner relates to subject matter that was surrendered during prosecution of the original patent.

The outstanding rejection appears to take the position that any claim that does not include the requirement that the attachment pads have "circular portions", is necessarily barred by the recapture doctrine. It is respectfully submitted that such a position is contrary to: (a) the precedent of the Federal Circuit; (b) the precedent of the Board of Appeals; and (c) the guidelines set forth in the MPEP. Specifically, it is respectfully submitted that both the MPEP and the Board's precedent make it clear that claims that are broader than the issued claims, **but narrower in relevant part than** the cancelled claims in the original application, are **not** barred by the recapture rule. See, e.g., MPEP §1412.02 (I)(C)(2)(d) and *Ex Parte Eggert*, 67 USPQ2d 1716 (Bd. Pat. App. & Inter. 2003) (precedential). In the present case, although the pending claims are broader than the **issued** claims in the '423 patent, **they are narrower in relevant part than the cancelled claims** in the original application. Specifically, they retain the requirement of the attachment pads, which is not a feature of the original claims, but instead was only added by in the Amendment filed July 8, 1999. In the context of the recapture issue, the reissue application merely seeks to broaden the permissible geometry of the attachment pads. Accordingly, it is respectfully submitted that the claims on appeal fall squarely within the circumstances set forth in MPEP §1412.02 (I)(C), MPEP §1412.02 (I)(C)(2)(d) and *Ex Parte Eggert* and accordingly are not barred by the recapture rule.

C) Step 3 – Were the Claims Materially Narrowed in Other Respects to Compensate for the Broadening in the Area of Surrender?

The third step that the Federal Circuit has articulated as being a necessary part of the recapture analysis is the determination of whether the claims have been materially narrowed in other respects. MPEP §1412.02(I)(C) explains this analysis. Specifically, MPEP §1412.02(I)(C) states:

When analyzing a reissue claim for the possibility of impermissible recapture, there are two different types of analysis that must be performed. If the reissue claim "fails" either analysis, recapture exists.

First, the reissue claim must be compared to any claims canceled or amended during prosecution of the original application. It is impermissible recapture for a reissue claim to be as broad or broader in scope than any claim that was canceled or amended in the original prosecution to define over the art. Claim scope that was canceled or amended is deemed surrendered and therefore barred from reissue. *In re Clement, supra*.

Second, it must be determined whether the reissue claim **entirely omits** any limitation that was added/argued during the original prosecution to overcome an art rejection. Such an omission in a reissue claim, even if it includes other limitations making the reissue claim narrower than the patent claim in other aspects, is impermissible recapture. *Pannu v. Storz Instruments Inc.*, *supra*. However, if the reissue claim recites a broader form of the key limitation added/argued during original prosecution to overcome an art rejection (and therefore not entirely removing that key limitation), then the reissue claim may not be rejected under the recapture doctrine. *Ex Parte Eggert*, 67 USPQ2d 1716 (Bd. Pat. App. & Inter. 2003) (precedential). For example, if the key limitation added to overcome an art rejection was "an orange peel," and the reissue claim instead recites "a citrus fruit peel", the reissue claim may not be rejected on recapture grounds. (*underlined emphasis original – bolded emphasis ours*)

With respect to the first analysis, the appealed claims are not as broad or broader in scope than any of the claims cancelled or amended during the original prosecution – and the Examiner has not alleged that they are broader than any cancelled/amended claim. Accordingly, it is respectfully submitted that the claims on appeal are clearly not barred under this test.

With respect to the second analysis the amendment at issue **added** the requirement of an attachment pad and further provided the constraint that the attachment pad portion be circular. Therefore, the limitation added/argued during original prosecution has NOT been entirely removed. Rather, the claims on appeal only seek to broaden the scope of the attachment pad feature that was added during prosecution. Therefore, much like the example in the MPEP in which reissue would be appropriate to broaden the phrase "an orange peel" to "a citrus fruit peel," it is respectfully submitted that merely broadening the geometry of the attachment pad feature added during prosecution is NOT an improper recapture of the original claim scope. Accordingly, it is respectfully submitted that the appealed claims may NOT properly be rejected under the recapture doctrine and that the outstanding rejections of the claims on appeal should be reversed.

III. THE CLAIMS ON APPEAL ARE MATERIALLY NARROWED IN OTHER RESPECTS AS WELL

Some precedent suggests that in order to avoid recapture, the reissue claims should be narrower than the cancelled claim in some aspect other than the broadened element that is material to patentability. In addition to the inclusion of the attachment pad limitation, which makes the claims narrower than the original claims as described above, in the present case, it is clear that all of the

claims on appeal contain several elements that are material to patentability that narrow the claims in other respects relative to the amendments at issue. Some of those differences are articulated below.

Independent Claim 11

As pending, claim 11 specifically requires several elements that were not present in the issued claims of the '423 patent and that materially narrow the scope of the claim relative to the scope of the issued claims of the '423 patent. As currently pending, appealed claim 11 reads:

11. An integrated circuit package comprising:
- a lead frame including a die attach platform, a plurality of contacts that are spaced apart from the die attach platform and a bus bar that is positioned between the die attach platform and at least some of the contacts, **wherein bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar**, and wherein each of the contacts includes a portion that forms an attachment pad;
 - a die carried by the die attach platform and electrically connected to the bus bar and at least some of the contacts; and
 - a protective casing covering the die and the lead frame while leaving bottom surfaces of the die attach platform, the bus bar and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the bus bar from at least some of the conductive contacts, whereby the attachment pads are exposed at the bottom surface of the package.**

As such, appealed claim 11 specifically requires at least the following material elements that were not present in the issued claims of the '423 patent:

- a) that the bottom surfaces of the die attach platform, the contacts and the bus bar be substantially co-planar;
- b) a protective casing that covers the die and lead frame and physically isolates the bus bar from at least some of the conductive contacts; and
- c) that the bottom surfaces of the die attach platform, the bus bar and the contacts be exposed at the bottom surface of the package.

Since each of these elements materially narrows the scope of the claims in a manner that is beyond the attachment pad feature, it is respectfully submitted that claim 11 should not be barred by the recapture rule for this reason as well.

Claims 12-18 each depend either directly or indirectly from independent claim 11 and it is respectfully submitted that these claims should not be barred by the recapture rule for at least the same reason.

Independent Claim 19

As pending, claim 19 also specifically requires several elements that were not present in the issued claims of the '423 patent and that materially narrow the scope of the claim relative to the scope of the issued claims of the '423 patent. As currently pending, appealed claim 19 reads:

19. An electronic module comprising an integrated circuit package and a printed circuit board, the printed circuit board having a ground, wherein the integrated circuit package comprises:

a lead frame including a die attach platform and a plurality of contacts, **wherein bottom surfaces of the die attach platform and the contacts are substantially co-planar, the die attach platform being directly electrically connected to the ground on the printed circuit board;**

a die carried by the die attach platform, **the die having** a plurality of signal pads that are electrically connected to at least some of the contacts, and **at least one ground pad that is electrically connected to the die attach platform;** and

a protective casing covering the die and the lead frame while leaving **bottom surfaces of the die attach platform and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the die attach platform from at least some of the conductive contacts, and wherein the exposed bottom surfaces of the contacts form attachment pads.**

As such, appealed claim 19 specifically requires the following material elements that were not present in the issued claims of the '423 patent:

- (a) that the bottom surfaces of the die attach platform and the contacts be substantially co-planar;
- (b) a protective casing that covers the die and lead frame and physically isolates the die attach platform from at least some of the conductive contacts;
- (c) that the bottom surfaces of the die attach platform and the contacts be exposed at the bottom surface of the package;
- (d) that the die attach platform be directly electrically connected to a ground on a printed circuit board.

Since each of these elements materially narrows the scope of the claims in a manner that is beyond the attachment pad feature, it is respectfully submitted that claim 11 should not be barred by the recapture rule for this reason as well.

Independent Claim 23

As pending, claim 23 specifically requires several elements that were not present in the issued claims of the '423 patent and that materially narrow the scope of the claim relative to the scope of the issued claims of the '423 patent. As currently pending, appealed claim 23 reads:

23. An integrated circuit package comprising:

a lead frame including a die attach platform, a plurality of contacts that are spaced apart from the die attach platform and a bus bar that is positioned between the die attach platform and at least some of the contacts, **wherein bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar**, wherein each of the contacts includes a portion that forms an attachment pad;

a die carried by the die attach platform and electrically connected to the bus bar and at least some of the contacts; and

a protective casing covering the die and the lead frame while leaving bottom surfaces of the die attach platform, the bus bar and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the bus bar from at least some of the conductive contacts; and

wherein the integrated circuit package may be attached to a substrate by soldering the attachment portions of the lead frame to the substrate.

As such, appealed claim 23 specifically requires the following material elements that were not present in the issued claims of the '423 patent:

- a) that the bottom surfaces of the die attach platform, the contacts and the bus bar be substantially co-planar;
- b) a protective casing that covers the die and lead frame and physically isolates the bus bar from at least some of the conductive contacts;
- d) that the bottom surfaces of the die attach platform, the bus bar and the contacts be exposed at the bottom surface of the package

Since each of these elements materially narrows the scope of the claims in a manner that is beyond the attachment pad feature, it is respectfully submitted that claim 23 should not be barred by the recapture rule for this reason as well.

Dependent Claim 15

Dependent claim 15 depends from independent claim 11 and it is respectfully submitted that the outstanding rejection of claim 15 under 35 USC §251 should be reversed for at least the reasons set forth above with respect to claim 11. Additionally, claim 15 specifically requires that: (a) the die includes ground pads that "are electrically connected to the die attach platform" and (b) that the die

attach platform is directly electrically connected to a ground on a printed circuit board. Both of these limitations materially narrow the claim scope in a manner that is not related to the attachment pad feature. Accordingly, it is respectfully submitted that claim 15 should not be barred by the recapture rule for this reason as well.

Dependent Claim 16

Dependent claim 16 depends from claim 15 and it is respectfully submitted that the outstanding rejection of claim 16 under 35 USC §251 should be reversed for at least the reasons set forth above with respect to claim 15. Additionally, claim 16 specifically requires that the die attach platform is directly electrically connected to the ground on the printed circuit board by soldering. This requirement materially narrows the claim scope in a manner that is not related to the attachment pad feature. Accordingly, it is respectfully submitted that claim 16 should not be barred by the recapture rule for this reason as well.

Dependent Claims 17 and 18

Dependent claim 17 depends from independent claim 11 and it is respectfully submitted that the outstanding rejection of claim 17 under 35 USC §251 should be reversed for at least the reasons set forth above with respect to claim 11. Additionally, claim 17 specifically requires that the exposed bus bar be directly electrically connected to a ground on a printed circuit board. Claim 18 depends from claim 17 and further requires a second bus bar that is directly electrically connected to the printed circuit board. These limitations both materially narrow the claim scope in a manner that is not related to the attachment pad feature. Accordingly, it is respectfully submitted that claims 17 and 18 should not be barred by the recapture rule for these reasons as well.

Dependent Claims 20, 21 and 22

Dependent claims 20, 21 and 22 each depend directly from independent claim 19 and it is respectfully submitted that the outstanding rejection of claims 20, 21 and 22 under 35 USC §251 should be reversed for at least the reasons set forth above with respect to claim 19. Additionally, claim 20 specifically requires that the die attach platform be directly electrically connected to the ground on the printed circuit board. Claim 21 specifically requires a bus bar that is directly electrically connected to a printed circuit board. Claim 22 specifically requires a plurality of bus bars that directly electrically connected to the printed circuit board. These limitations each materially narrow the claim scope in a manner that is not related to the attachment pad feature. Accordingly, it

is respectfully submitted that claims 20, 21 and 22 should not be barred by the recapture rule for these reasons as well.

IV. CONCLUSION

In view of the forgoing, it is respectfully submitted that the outstanding rejections of claims 11-23 should be reversed.

Respectfully Submitted,
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V. CLAIMS APPENDIX

CLAIMS ON APPEAL

11. An integrated circuit package comprising:

a lead frame including a die attach platform, a plurality of contacts that are spaced apart from the die attach platform and a bus bar that is positioned between the die attach platform and at least some of the contacts, wherein bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar, and wherein each of the contacts includes a portion that forms an attachment pad;

a die carried by the die attach platform and electrically connected to the bus bar and at least some of the contacts; and

a protective casing covering the die and the lead frame while leaving bottom surfaces of the die attach platform, the bus bar and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the bus bar from at least some of the conductive contacts, whereby the attachment pads are exposed at the bottom surface of the package.

12. An integrated circuit package as recited in claim 11 wherein the bus bar is a first bus bar, the integrated circuit further comprising a second bus bar that is also positioned between the die attach platform and some of the contacts.

13. An integrated circuit package as recited in claim 12 wherein the first and second bus bars are located on opposite sides of the die attach platform.

14. An integrated circuit package as recited in claim 11 further comprising bonding wires for electrically connecting the die to the bus bar and the contacts.

15. An electronic module comprising:

an integrated circuit package as recite in claim 11 wherein ground pads on the die are electrically connected to the die attach platform; and

a printed circuit board, wherein the die attach platform is directly electrically connected to a ground on the printed circuit board.

16. An electronic module as recited in claim 15 wherein the die attach platform is directly electrically connected to the ground on the printed circuit board by soldering.

17. An electronic module comprising:

an integrated circuit package as recite in claim 11; and

a printed circuit board, wherein the bus bar is directly electrically connected to the printed circuit board.

18. An electronic module as recited in claim 17 wherein the bus bar is a first bus bar, the integrated circuit further comprising a second bus bar that is also positioned between the die attach platform and some of the contacts and wherein both the first and second bus bars are directly electrically connected to the printed circuit board.

19. An electronic module comprising an integrated circuit package and a printed circuit board, the printed circuit board having a ground, wherein the integrated circuit package comprises:

a lead frame including a die attach platform and a plurality of contacts, wherein bottom surfaces of the die attach platform and the contacts are substantially co-planar, the die attach platform being directly electrically connected to the ground on the printed circuit board;

a die carried by the die attach platform, the die having a plurality of signal pads that are electrically connected to at least some of the contacts, and at least one ground pad that is electrically connected to the die attach platform; and

a protective casing covering the die and the lead frame while leaving bottom surfaces of the die attach platform and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the die attach platform from at least some of the conductive contacts, and wherein the exposed bottom surfaces of the contacts form attachment pads.

20. A module as recited in claim 19 wherein the die attach platform is directly electrically connected to the ground on the printed circuit board by soldering.

21. A module as recited in claim 19 wherein the lead frame further includes a bus bar positioned between the die attach platform and at least some of the contacts, and wherein the bus bar is directly electrically connected to the printed circuit board.

22. A module as recited in claim 19 wherein the lead frame further includes a plurality of bus bars positioned between the die attach platform and at least some of the contacts, and wherein each bus bars directly electrically connected to the printed circuit board.

23. An integrated circuit package comprising:

a lead frame including a die attach platform, a plurality of contacts that are spaced apart from the die attach platform and a bus bar that is positioned between the die attach platform and at least some of the contacts, wherein bottom surfaces of the die attach platform, the contacts and the bus bar are substantially co-planar, wherein each of the contacts includes a portion that forms an attachment pad;

a die carried by the die attach platform and electrically connected to the bus bar and at least some of the contacts; and

a protective casing covering the die and the lead frame while leaving bottom surfaces of the die attach platform, the bus bar and the conductive contacts exposed, wherein encapsulation material that forms the protective casing is exposed at a bottom surface of the package to physically isolate the bus bar from at least some of the conductive contacts; and

wherein the integrated circuit package may be attached to a substrate by soldering the attachment portions of the lead frame to the substrate.